

CLAIMS

What is claimed is:

- 1 1. A microelectronic device package, comprising:
2 an electrically conductive lid having an attachment surface;
3 a substrate having an attachment surface;
4 at least one electrically conductive first interconnect extending between said lid
5 attachment surface and said substrate attachment surface;
6 at least one microelectronic die disposed between said lid attachment surface and
7 said substrate attachment surface; and
8 said substrate having at least one first conductive trace extending between said
9 electrically conductive first interconnect and said microelectronic die.
- 1 2. The microelectronic device package of claim 1, further including a first
2 signal line in electrical communication with said electrically conductive lid.
- 1 3. The microelectronic device package of claim 1, wherein said electrically
2 conductive lid comprises thermally conductive heat dissipation device.
- 1 4. The microelectronic device package of claim 3, further comprising a
2 thermal interface material disposed between said heat dissipation device and a back
3 surface of said at least one microelectronic die.

1 5. The microelectronic device package of claim 1, further comprising:
2 a socket having a first surface, a second surface opposing said first surface; and a
3 recess extending into said socket from said socket first surface;
4 said substrate and said microelectronic die substantially residing in said socket
5 recess; and
6 a portion of said lid extending proximate said socket first surface.

1 6. The microelectronic device package of claim 5, further including at least
2 one first signal line extending from said socket second surface to said socket first surface,
3 wherein said first signal trace is in electrical contact with said lid.

1 7. The microelectronic device package of claim 6, further including at least
2 one external contact contacting said at least one first signal line proximate said socket
3 second surface.

1 8. The microelectronic device package of claim 5, further including at least
2 one second signal line extending from said socket second surface to said socket recess,
3 wherein said second signal trace is in electrical contact with said substrate.

1 9. The microelectronic device package of claim 8, further including at least
2 one external contact contacting said at least one second signal line proximate said socket
3 second surface.

1 10. The microelectronic device package of claim 1, wherein said electrically
2 conductive lid comprises dielectric lid having an electrically conductive signal trace
3 proximate said lid attachment surface; and further comprising at least one electrically
4 conductive first interconnect contacting said electrically conductive signal trace.

1 11. The microelectronic device package of claim 1, further comprising:
2 an electrically conductive signal trace proximate said lid attachment surface and a
3 dielectric layer disposed between said electrically conductive signal trace and said lid
4 attachment surface;
5 at least one electrically conductive second interconnect extending between said at
6 least one electrically conductive signal trace and said substrate; and
7 said substrate having at least one second conductive trace extending between said
8 electrically conductive second interconnect and said microelectronic die.

1 12. The microelectronic device package of claim 11, further including a
2 second signal line in electrical communication with said at least one electrically
3 conductive signal trace.

1 13. The microelectronic device package of claim 11, wherein said electrically
2 conductive lid comprises thermally conductive heat dissipation device.

1 14. The microelectronic device package of claim 13, further comprising a
2 thermal interface material disposed between said heat dissipation device and a back
3 surface of said at least one microelectronic die.

1 15. The microelectronic device package of claim 11, further comprising:
2 a socket having a first surface, a second surface opposing said first surface; and a
3 recess extending into said socket from said socket first surface;
4 said substrate and said microelectronic die substantially residing in said socket
5 recess; and
6 a portion of said lid extending proximate said socket first surface.

1 16. The microelectronic device package of claim 15, further including at least
2 one first signal line and at least one second signal line each extending from said socket
3 second surface to said socket first surface, wherein said first signal trace is in electrical
4 contact with said lid and wherein said third signal line is in electrical contact with said
5 electrically conductive signal trace.

1 17. The microelectronic device package of claim 16, further including at least
2 one external contact contacting said at least one first signal line proximate said socket

1 second surface and at least one external contact contacting said at least one third signal
2 line proximate said socket second surface.

1 18. The microelectronic device package of claim 15, further including at least
2 one second signal line extending from said socket second surface to said socket recess,
3 wherein said second signal trace is in electrical contact with said substrate.

1 19. The microelectronic device package of claim 18, further including at least
2 one external contact contacting said at least one second signal line proximate said socket
3 second surface.

1 20. An electronic system, comprising:
2 an external substrate within a housing; and
3 at least one microelectronic device package attached to said external substrate,
4 including:
5 an electrically conductive lid having an attachment surface;
6 a substrate having an attachment surface;
7 at least one electrically conductive first interconnect extending between
8 said lid attachment surface and said substrate attachment surface;
9 at least one microelectronic die disposed between said lid attachment
10 surface and said substrate attachment surface; and

1 said substrate having at least one first conductive trace extending between
2 said electrically conductive first interconnect and said microelectronic die; and
3 an input device interfaced with said external substrate; and
4 a display device interfaced with said external substrate.

1 21. The electronic system of claim 20, said microelectronic device package
2 further including a first signal line in electrical communication with said electrically
3 conductive lid.

1 22. The electronic system of claim 20, said microelectronic device package
2 further comprising:
3 a socket having a first surface, a second surface opposing said first surface; and a
4 recess extending into said socket from said socket first surface;
5 said substrate and said microelectronic die substantially residing in said socket
6 recess; and
7 a portion of said lid extending proximate said socket first surface.

1 23. The electronic system of claim 22, said microelectronic device package
2 further including at least one first signal line extending from said socket second surface to
3 said socket first surface, wherein said first signal trace is in electrical contact with said
4 lid.

1 24. The electronic system of claim 23, said microelectronic device package
2 further including at least one external contact contacting said at least one first signal line
3 proximate said socket second surface.

1 25. The electronic system of claim 22, said microelectronic device package
2 further including at least one second signal line extending from said socket second
3 surface to said socket recess, wherein said second signal trace is in electrical contact with
4 said substrate.

1 26. The electronic system of claim 25, said microelectronic device package
2 further including at least one external contact contacting said at least one second signal
3 line proximate said socket second surface.

1 27. The electronic system of claim 20, wherein said electrically conductive lid
2 comprises dielectric lid having an electrically conductive signal trace proximate said lid
3 attachment surface; and further comprising at least one electrically conductive first
4 interconnect contacting said electrically conductive signal trace.

1 28. The electronic system of claim 20, said microelectronic device package
2 further comprising:

1 an electrically conductive signal trace proximate said lid attachment surface and a
2 dielectric layer disposed between said electrically conductive signal trace and said lid
3 attachment surface;
4 at least one electrically conductive second interconnect extending between said at
5 least one electrically conductive signal trace and said substrate; and
6 said substrate having at least one second conductive trace extending between said
7 electrically conductive second interconnect and said microelectronic die.

1 29. The electronic system of claim 28, said microelectronic device package
2 further including a second signal line in electrical communication with said at least one
3 electrically conductive signal trace.

1 30. The electronic system of claim 28, said microelectronic device package
2 further comprising:
3 a socket having a first surface, a second surface opposing said first surface; and a
4 recess extending into said socket from said socket first surface;
5 said substrate and said microelectronic die substantially residing in said socket
6 recess; and
7 a portion of said lid extending proximate said socket first surface.

1 31. The electronic system of claim 30, said microelectronic device package
2 further including at least one first signal line and at least one second signal line each

1 extending from said socket second surface to said socket first surface, wherein said first
2 signal trace is in electrical contact with said lid and wherein said third signal line is in
3 electrical contact with said electrically conductive signal trace.

1 32. The electronic system of claim 31, said microelectronic device package
2 further including at least one external contact contacting said at least one first signal line
3 proximate said socket second surface and at least one external contact contacting said at
4 least one third signal line proximate said socket second surface.

1 33. The electronic system of claim 30, said microelectronic device package
2 further including at least one second signal line extending from said socket second
3 surface to said socket recess, wherein said second signal trace is in electrical contact with
4 said substrate.

1 34. The electronic system of claim 33, said microelectronic device package
2 further including at least one external contact contacting said at least one second signal
3 line proximate said socket second surface.

1 35. A method of delivering at least one signal to a microelectronic die,
2 comprising:
3 providing an electrically conductive lid having an attachment surface;
4 providing a substrate having an attachment surface;

1 disposing at least one electrically conductive first interconnect extending between
2 said lid attachment surface and said substrate attachment surface;
3 disposing at least one microelectronic die between said lid attachment surface and
4 said substrate attachment surface;
5 providing at least one first conductive trace extending between said electrically
6 conductive first interconnect and said microelectronic die; and
7 delivering a signal to said electrically conductive lid.

1 36. The method of claim 35, wherein providing said electrically conductive lid
2 comprises providing thermally conductive heat dissipation device.

1 37. The method of claim 36, further comprising disposing a thermal interface
2 material between said heat dissipation device and a back surface of said at least one
3 microelectronic die.

1 38. The method of claim 35, further comprising:
2 providing a socket having a first surface, a second surface opposing said first
3 surface; and a recess extending into said socket from said socket first surface; and
4 disposing said substrate and said microelectronic die substantially within said
5 socket recess; wherein a portion of said lid extends proximate said socket first surface.

1 39. The method of claim 38, further including providing at least one first
2 signal line extending from said socket second surface to said socket first surface, wherein
3 said first signal trace is in electrical contact with said lid.

1 40. The method of claim 39, further including providing at least one external
2 contact contacting said at least one first signal line proximate said socket second surface.

1 41. The method of claim 39, further including providing at least one second
2 signal line extending from said socket second surface to said socket recess, wherein said
3 second signal trace is in electrical contact with said substrate.

1 42. The method of claim 41, further including providing at least one external
2 contact contacting said at least one second signal line proximate said socket second
3 surface.

1 43. The method of claim 35, wherein providing said electrically conductive lid
2 comprises providing a dielectric lid having an electrically conductive signal trace
3 proximate said lid attachment surface; and further providing at least one electrically
4 conductive first interconnect contacting said electrically conductive signal trace.

1 44. The method of claim 35, further comprising:

1 providing an electrically conductive signal trace proximate said lid attachment
2 surface and a dielectric layer disposed between said electrically conductive signal trace
3 and said lid attachment surface;

4 providing at least one electrically conductive second interconnect extending
5 between said at least one electrically conductive signal trace and said substrate; and

6 providing said substrate having at least one second conductive trace extending
7 between said electrically conductive second interconnect and said microelectronic die.

1 45. The method of claim 44, further including providing a second signal line
2 in electrical communication with said at least one electrically conductive signal trace.

1 46. The method of claim 44, wherein said providing electrically conductive lid
2 comprises providing thermally conductive heat dissipation device.

1 47. The method of claim 46, further comprising a thermal interface material
2 disposed between said heat dissipation device and a back surface of said at least one
3 microelectronic die.

1 48. The method of claim 46, further comprising:
2 a socket having a first surface, a second surface opposing said first surface; and a
3 recess extending into said socket from said socket first surface;

1 said substrate and said microelectronic die substantially residing in said recess;
2 and
3 a portion of said lid extending proximate said socket first surface.

1 49. The method of claim 48, further including at least one first signal line and
2 at least one second signal line each extending from said socket second surface to said
3 socket first surface, wherein said first signal trace is in electrical contact with said lid and
4 wherein said third signal line is in electrical contact with said electrically conductive
5 signal trace.

1 50. The method of claim 49, further including at least one external contact
2 contacting said at least one first signal line proximate said socket second surface and at
3 least one external contact contacting said at least one third signal line proximate said
4 socket second surface.

1 51. The method of claim 46, further including at least one second signal line
2 extending from said socket second surface to said socket recess, wherein said second
3 signal trace is in electrical contact with said substrate.

1 52. The method of claim 51, further including at least one external contact
2 contacting said at least one second signal line proximate said socket second surface.